Catalyst 2000 Series

This chapter provides information on the Catalyst 2000 series switches. The information is organized into the following sections:

- Product Overview
- Standard Features
- Catalyst 2800 Modules
- Applications
- Product Numbers

Note Documentation for the Catalyst 2000 series switches is available in two forms: on a CD-ROM called Cisco Connection Documentation, Enterprise Series (formerly called UniverCD) and printed books. You can request a free copy of the documentation CD when you place an order and have the option of subscribing to a CD update service. A user guide ships with each switch.

You can also access Cisco technical documentation on the World Wide Web URL http://www.cisco.com. For more information, see the chapter "Documentation" at the end of the catalog.

Product Overview

Cisco Systems' standalone Catalyst 2000 series switches combine high-speed configuration flexibility with exceptional affordability for workgroup applications. Available for a very low cost per port, these switches are ideal for Ethernet workgroups and individual users requiring increased performance and 100BaseT, FDDI, or future Asynchronous Transfer Mode (ATM) connectivity to servers and backbones.

The Catalyst 2000 series is part of Cisco's Catalyst family, a comprehensive line of high-performance switches designed to help you easily migrate from traditional shared LANs to fully switched networks. An integral element of the CiscoFusion scalable architecture, the Catalyst family delivers the varying levels of flexibility and cost-effectiveness required for today's desktop, workgroup, and backbone applications while enabling enterprise-wide switched internetworks.

The Catalyst 2000 series consists of three models:

- Catalyst 2100 switch—supports 1024 MAC addresses and has twenty-five 10BaseT ports for connecting individual workstations and existing 10BaseT hubs and two 100BaseTX ports for server and backbone connectivity.
- Catalyst 2800 switch—supports 2048 or 8192 MAC addresses and has twenty-five 10BaseT ports and two high-speed expansion slots for 100BaseT, FDDI, and, in the future, ATM modules, for server and backbone connectivity.
- Catalyst 2900 switch—supports up to 16,000 MAC addresses, has fourteen Fast Ethernet ports in a fixed configuration of either 10/100BaseTX or 100BaseFX, and can be used to deploy 100-Mbps Fast Ethernet connections to existing LAN segments or high-performance workstations and servers.

Figure 119 Catalyst 2100 Switch

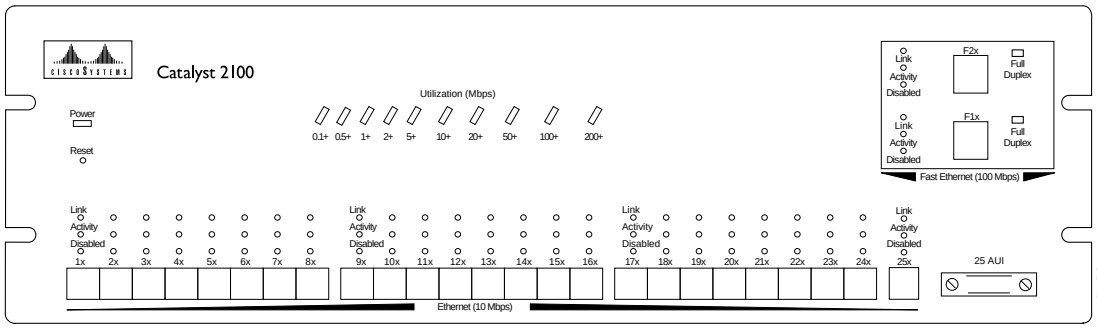

Figure 120 Catalyst 2800 Switch

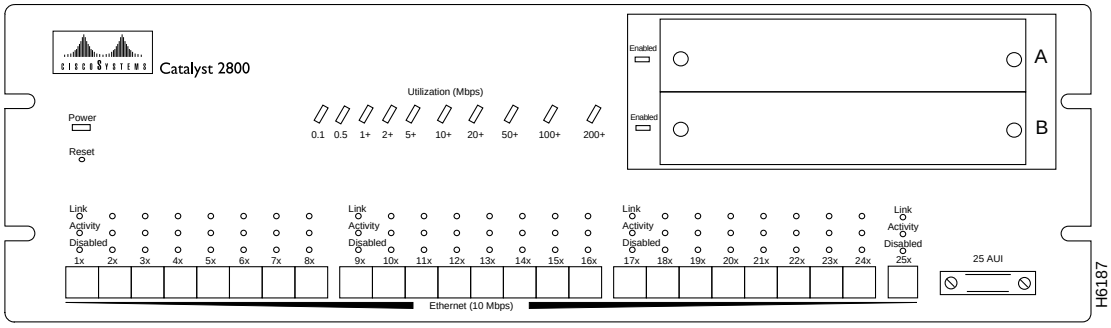

Figure 121 Catalyst 2900 Switch Front Panel

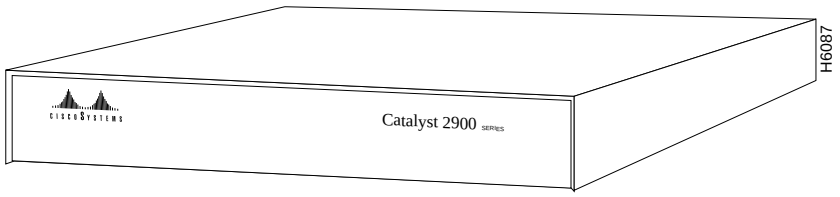

Figure 122 Catalyst 2900 Switch Rear Panel

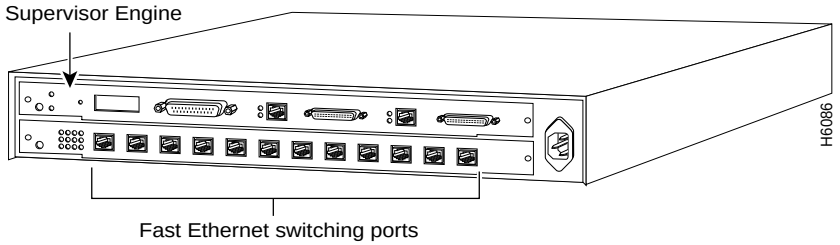

Table 257 Catalyst 2100 and 2800 Summary of Features

Characteristic	Description
Performance	1-Gbps bus Up to 320-Mbps maximum forwarding bandwidth Packet forwarding rates (64-byte packets): 14,880 packets per second (pps) to 10BaseT ports 133,980 pps to 100BaseT ports Up to 100,000 pps to FDDI ports Latency (FastForward switching mode): 31 microseconds between 10BaseT ports 7 microseconds between 100BaseT ports
Network management support	SNMP MIB II (RFC 1213) FDDI MIB (RFC 1512) SNMP MIB extensions Telnet Bridging MIB (RFC 1493) Out-of-band management console FDDI SMT 7.3
Frame processing	Destination address filtering IEEE 802.1d compatible including Spanning-Tree Protocol support Flooding control option prevents ports from receiving traffic destined to unknown addresses Selectable switching options: FastForward—forward after destination address FragmentFree—forward after collision window Store-and-Forward—forward after packet receipt Secure addressing mode prevents unauthorized users from accessing the network by securing an individual MAC address or group of addresses to a specific port

Characteristic	Description
Buffers and addressing	Buffer: 3-MB shared memory Addresses: Catalyst 2100: 1024 per system Catalyst 2800: 2048 or 8192 per system
Interfaces	10-Mbps ports: RJ-45 connectors for 24 ports; RJ-45 and AUI connectors for 25th port Two-pair Category 3, 4, or 5 UTP wiring (RJ-45), supports standard transceivers (AUI) 100BaseTX ports (Catalyst 2100): RJ-45 connectors—Two-pair Category 5 UTP wiring High-speed expansion slots for modules (Catalyst 2800) EIA/TIA-232[1] management console port: DB-9 connector
Agency approvals	UL 1950 CE CSA 22.2, LR100902 TUV, EN60950 FCC Class A EN55022A
LEDs	Per-port status LEDs: Link Integrity, Disabled, and Activity System status LEDs: Power, Utilization Meter, and Module Enabled Status (Catalyst 2800)
Dimensions (H x W x D)	5.25 x 19 x 12.28" (13.34 x 48.26 x 31.2 cm)
Weight	Catalyst 2100: 18 lbs (8.17 kg) Catalyst 2800: 23 lbs (10.4 kg)

1. EIA/TIA-232 was known as recommended standard RS-232 before its acceptance as standard by the Electronic Industries Association (EIA) and Telecommunications Industry Association (TIA).

Table 258 Catalyst 2100 and 2800 Environmental Specifications

Characteristic	Description
Input voltage	90 to 250 volts, 50 to 60 Hz
Power consumption	Catalyst 2100: 60W Catalyst 2800: 110W
Environmental conditions	Operating temperature: 32 to 104 F (0 to 40 C) Operating relative humidity: 10% to 90% noncondensing Operating altitude: up to 10,000' (3048 m)

Table 259 Catalyst 2900 Summary of Features

Characteristics	Description
Placement	Rack-mounted, front or back (standard 19-inch rack)
Switching backplane	1.2-Gbps, supports over 1 million packets per second (pps)
Memory	4-MB Flash memory 8-MB DRAM 128-KB NVRAM 512-KB EPROM

Characteristics	Description
Interfaces	Supervisor console: DB-25 (female) Supervisor 100BaseTX: RJ-45 (female), MII[1](female) 10/100BaseTX: RJ-45 autosensing 100BaseFX: SC
Duplex	10-Mbps Ethernet: Full or half duplex 100-Mbps Fast Ethernet: Full or half duplex
Network management	Cisco Discovery Protocol Cisco Virtual Trunking Protocol (VTP) SNMP agent v1 (RFC 1155-1157) SNMP MIB II (RFC 1213) Ethernet MIB (RFC 1398) Interface table (RFC 1573) Bridge MIB (1493) Cisco Workgroup MIB
Maximum station-to-station cabling distance	10/100BaseTX Ethernet: Category 5 UTP: 328' (100 m) 100BaseFX Ethernet: 62.75/125 micron fiber (400 m half duplex, 2 km full duplex)
Agency approvals	FCC Class A (47 CFR Part 15) EN 55022A Class B on shielded UTP VCCI Class 1 VDE Class B UL 1950 CSA-C22.2 No. 950 93 EN 60950 CE Mark
LEDs	Status LED on each interface shows successful completion, minor and major failure of power-up diagnostics Link Good LED shows status of any interface Switch Load LEDs show backplane utilization
Dimensions (H x W x D)	3.4 x 17.25 x 23.0" (8.5 x 43.8 x 58.4 cm)
Weight	Typical: 41 lb (18.6 kg) Average shipping: 52 lb (23.6 kg)

1. MII = Media-independent interface.

Table 260 Catalyst 2900 Environmental Specifications

Description	Specification
Input voltage	3A @ 100-240 VAC 50/60 Hz
Power consumption	264W
Heat dissipation	264W, 901 Btu/hour

Standard Features

Catalyst 2100 and 2800 switches support the following standard features:

- Twenty-five 10BaseT ports deliver 10 Mbps of bandwidth to workstations or hubs to support bandwidth-intensive applications.
- Two 100BaseTX ports (Catalyst 2100) or two high-speed expansion slots (Catalyst 2800) provide maximum high-speed configuration and backbone flexibility.
- CollisionFree full-duplex operation on the 100BaseT ports delivers up to 200-Mbps of bandwidth to servers and between switches.
- Nonblocking, ClearChannel switch architecture supports wire-speed bridging and up to 320-Mbps maximum forwarding bandwidth for exceptional performance.
- Shared-memory architecture with 3-MB packet buffer virtually eliminates packet loss.
- Choice of cut-through or store-and-forward switching lets administrators optimize for performance or error checking.
- Multicast address packet filtering maximizes network and server capacity in multimedia LAN applications.
- IEEE 802.1d Spanning-Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance.
- User-selectable address learning mode simplifies configuration and enhances security.
- Telnet, SNMP, and SMT support available for comprehensive in-band manageability; a menu-based management console provides in-depth out-of-band manageability.
- SwitchProbe monitoring port monitors traffic of a single port, a group of ports, or the entire switch from a single network analyzer or remote monitoring (RMON) probe.
- Up to four, port-configurable intraswitch VLANs provide broadcast traffic control, firewall protection, and simplified adds, moves, and changes.

The Catalyst 2900 switch supports the follwing standard features:

- 14-port fixed configuration chassis, which includes a single power supply
- Supervisor Engine:
  - High-performance, low latency 1.2-Gbps switching backplane with tri-level priority
  - Hardware-based support for static entries and self-learning of the 16,000 active MAC addresses and associated VLANs in the bridge lookup table
  - 25-MHz 68EC040 network management processor
  - Two Fast Ethernet interfaces (full or half-duplex), which can be ISL trunks
  - Fully integrated support for 1024 VLANs
  - Console port (female DCE EIA/TIA-232)
  - 8-MB DRAM
  - 4-MB Flash EPROM for downloadable microcode and software upgrades
  - 256-KB NVRAM

  - 192-KB input buffers per interface
  - Self-diagnostics at startup and runtime
  - Environmental monitoring
- VLAN ISL support
  - Virtual Trunking Protocol (VTP) for distributing VLAN configuration information
  - Virtual Trunking Protocol MIB
  - Dynamic ISL Protocol providing SNMP instrumentation for VTP
- Embedded RMON: provides the following four RMON groups: statistics, history, alarms, events
- Switched port analyzer functionality: allows monitoring of a single port or VLAN via a single monitor port. Segment traffic is “mirrored” to a user-designated port
- Load sharing via spanning-tree priority on a per-VLAN basis on ISL trunks between Catalyst 2900 and Catalyst 5000s; multiple ports can be used to achieve 800 Mbps and above
- 10/100 Fast Ethernet interface with autosensing speed detection for easy upgrade
- Standards-compliant Fast Ethernet interfaces for 100BaseTX and 100BaseFX
- AC power supply
- Power cord
- Rack-mounting hardware
- Cable management system

Catalyst 2800 Modules

The field-installable modules for the Catalyst 2800 Ethernet switch provide a choice of 100BaseT Fast Ethernet or FDDI connections supporting Category 5 UTP and fiber-optic cabling. These modules, which can be used in any combination, provide high-speed configuration, wiring, and backbone flexibility. Table 261 shows the Catalyst 2800 100BaseT and FDDI module options.

Table 261 Catalyst 2800 100BaseT and FDDI Module Options

Module	Description	Cable Type
100BaseTX	1-port UTP 8-port UTP	Category 5
100BaseFX	1-port fiber 4-port fiber	Multimode fiber
FDDI fiber	1-port DAS 1-port SAS	Multimode fiber
FDDI UTP (CDDI)	1-port SAS	Category 5

The 100BaseT and FDDI modules plug directly into the high-speed expansion slots on the Catalyst 2800 switch. These modules are field-installable, providing you with the flexibility to change your network configuration while preserving your investment in the base switch. The hot-swappable design lets new modules be installed while the switch is operational, minimizing network downtime.

Applications

10BaseT hubs and individual nodes connect to the Catalyst 2100 and Catalyst 2800 switches to boost network performance. Small and large workgroups can be accommodated with UTP or fiber uplinks to 100BaseT, FDDI or (future) ATM servers and backbone connections on Cisco routers, Catalyst switches, or CDDI/FDDI Workgroup Stack concentrators. Branch offices can link the switches via 10-Mbps Ethernet to Cisco access routers for forwarding traffic to headquarters locations.

Modules can be mixed and matched in the Catalyst 2800 for optimal network configuration. For example, a 100BaseT module in one slot can be used as a cost-effective local backbone to other switches, and an FDDI module in the second slot as a connection to the building backbone.

For high-speed access to decentralized servers, the Catalyst 2100 delivers two switched 100BaseTX connections each providing up to 200-Mbps of bandwidth in full-duplex mode. The Catalyst 2800 offers a choice of single-port switched 100BaseT or FDDI connections to departmental servers or multiport shared 100BaseT connections to a departmental server cluster.

Product Numbers

Table 262 provides product numbers for the Catalyst 2000 series switches.

Table 262 Catalyst 2000 Series Switch Product Numbers

Description	Product Number
Catalyst 2100 switch	WS-C2100
Catalyst 2800 switch, 2K MAC	WS-C2802
Catalyst 2800 switch, 8K MAC	WS-C2808
Catalyst 2800 module, 1-port 100BaseTX	WS-X2811
Catalyst 2800 module, 8-port 100BaseTX	WS-X2818
Catalyst 2800 module, 1-port 100BaseFX	WS-X2821
Catalyst 2800 module, 4-port 100BaseFX	WS-X2824
Catalyst 2800 module, FDDI UTP SAS (CDDI)	WS-X2831
Catalyst 2800 module, FDDI fiber SAS	WS-X2841
Catalyst 2800 module, FDDI fiber DAS	WS-X2842
Catalyst 2900 14-port, 10/100BaseTX Fast Ethernet switch, UTP interfaces	WS-C2901
Catalyst 2900 14-port, 100BaseFX, Fast Ethernet switch, fiber (SC) interfaces	WS-C2902
SMARTnet maintenance for Catalyst 2900	CON-SNT-WS-C290X
SMARTnet maintenance for Catalyst 2100 and 2800	CON-SNT-WS-C2000
Documentation	See the chapter “Documentation.”